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The PSRT Team

From L-R Úna Findlay (PHE), Helen Best (PHE), Julia Abernethy (NHSI), Martin Duxbury (SCoR Clinical rep), Tony Murphy (Lay rep), Maria Murray (SCoR), Carl Rowbottom (IPEM), not shown in picture Marianne Illsley (RCR rep)

Welcome to Safer Radiotherapy (RT). The aim of the newsletter is to provide a regular update on the analysis by PHE of radiotherapy error (RTE) reports. These anonymised reports are submitted on a voluntary basis through the National Reporting and Learning System (NRLS) of NHS Improvement & England or directly to PHE, to promote learning and minimise recurrence of these events. Safer RT is designed to disseminate learning from RTE to professionals in the RT community to positively influence local practice and improve patient safety.

Published 3 times a year, Safer RT contains key messages and trends from the analysis of RTE reports. Any comments and suggestions for inclusion in the newsletter can be sent to radiotherapy@phe.gov.uk and would be gratefully received. Thanks to all contributors to this issue. The next issue of Safer Radiotherapy will be published in September 2019 and will be available at www.gov.uk/government/collections/medical-radiation-uses-dose-measurements-and-safety-advice

Helen Best, Editor

PSRT update

The patient safety in radiotherapy group has a remit to improve patient safety in radiotherapy in the UK. It provides a forum for the discussion and review of current matters associated with exposures of individuals to ionising radiation, by the relevant bodies across the UK. In March, Julia Abernethy from NHS Improvement & England was welcomed as a new member. The group has set new targets for supporting providers with RTE reporting these include:

- **100%** NHS providers uploading RTE a minimum of every 3 months
- **100%** providers using the causative factor taxonomy
- **100%** providers using the method of detection (effective safety barrier) coding

Updates will be shared in upcoming newsletters.

IR(ME)R guidance

The following guidance documents on the new IRMER are under development:

- Radiotherapy Board, update to 'A guide to understanding the implications of IR(ME)R in radiotherapy' due 2019
- Clinical Imaging Board, update to 'A guide to understanding the implications of IR(ME)R in diagnostic and interventional radiology' due 2019
- Inspectorate guidance on accidental and unintended exposures due 2019
- IPEM, update to 'Medical and dental guidance notes' due 2019

Content	

Uptake of the safety barrier (SB) taxonomy to identify method of detection (MD)

SB are inherent across the radiotherapy pathway and are designed to reduce the risk of errors occurring. The SB taxonomy can be used to identify when SB fail and when they are effective. The utilisation of the SB taxonomy to identify effective SBs or methods of detection (MD) was suggested in January 2018. Analysis of the data from March 2018 to March 2019 indicates that 72.1% (n = 44) providers shared MD within just 14.0% (n = 1386) of reports.

To enhance learning all RTE should contain the trigger code, classification, coding, including failed SB, methods of detection and causative factors. For example:
TSRT9/ Level 3/ 10c/10l/11r/11s/11t/20a/ MD13i/ CF1b/ CF1a/ CF5a/ CF5d

Publications

The fifth biennial radiotherapy error and near miss data report has been published and is available for the RT community at **www.gov.uk/government/publications/radiotherapy-errors-and-near-misses-data-report**

A report on the safety culture within the NHS has been published by the CQC; it is available at **www.cqc.org.uk/sites/default/files/20181224_openingthedoor_report.pdf**

An update to Safety is No Accident has been released by ASTRO; it is available at **www.astro.org/ASTRO/media/ASTRO/Patient%20Care%20and%20Research/PDFs/Safety_is_No_Accident.pdf**

NHS England have published sevice specifications, which includes information relating to reporting RTE; it is available at **www.england.nhs.uk/commissioning/spec-services/npc-crg/group-b/b01/**

Links to international patient safety resources

ASTRO and AAPM RO-ILS Quarterly report Q1-Q2 2018

Autorité De Sûreté Nucléaire (French Nuclear Safety Authority) Publications for Professionals

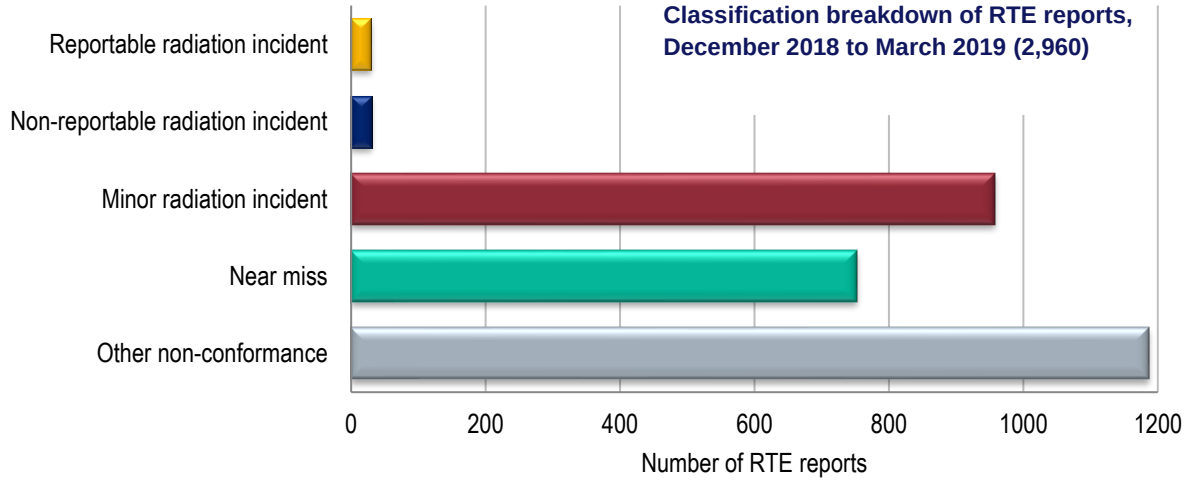
IAEA, SAFRON Updates on Patient Safety in Radiotherapy

RTE Data analysis: December 2018 to March 2019

Submissions from 54 NHS UK providers out of 61 contributed to this issue's full data analysis, covering December 2018 to March 2019. SEVEN providers have not reported or not used the TSRT9 trigger code to report RTE through the NRLS for this reporting period. Four providers have not reported RTE as part of this initiative for the year March 2018 to March 2019. Help with reporting is available at radiotherapy@phe.gov.uk

The full data analysis is available at www.gov.uk/government/collections/medical-radiation-uses-dose-measurements-and-safety-advice and includes data on primary process coding, safety barriers, causative factors, methods of detection and the severity classification of the RTE.

Classification of RTE



Of those 2,960 RTE reported for the period December 2018 to March 2019, 2,899 reports (98.0%) were classified as minor radiation incidents, near misses or other non-conformances. These are lower-level incidents which would have no significant effect on the planning or delivery of individual patient treatments.

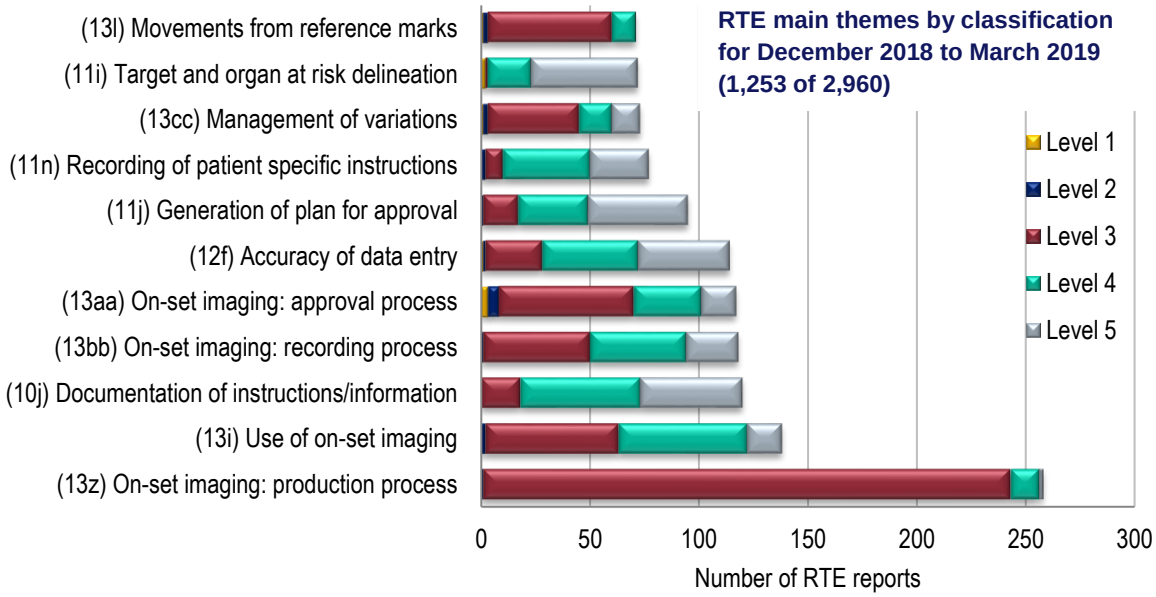
Reportable radiation incidents (level 1) made up 30 (1.0%) of all reports. 'Choice of other concurrent treatment or interventions and their sequencing or timing' and 'on-set imaging: approval process' each comprised of 10% (n = 3) of these reportable radiation incidents. Non-reportable radiation incident reports (level 2) made up 31 (1.0%) of all reports. 'On-set imaging: approval process' comprised 5 (16.1%) of all level 2 RTE. Level 1 and 2 reports made up 61 (2.0%) for this reporting period which is consistent with the previous analysis (1.7%, n = 55).

Of the 958 minor radiation incidents (level 3) reported, 242 (24.3%) of this subset were related to the 'on set imaging: production process', making it the most frequently reported code in this classification, this is a decrease from 34.8% (n = 427) in the previous 4 monthly analyses.

The most frequently reported RTE process code in the near miss (level 4) classification was 'use of on-set imaging' with 59 reports (7.8%). Within the non-conformance (level 5) classification 'communication of appointments to patients' comprised 51 reports (4.3%) making this the most frequently reported RTE in this classification.

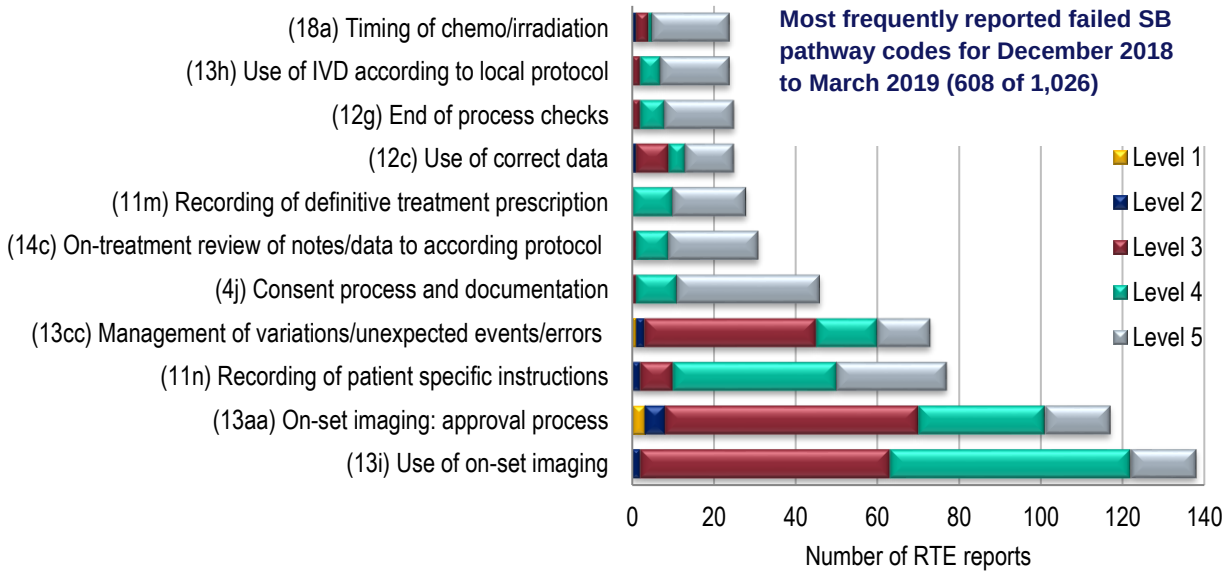
Primary process code

The main themes (points in the patient pathway where the majority of reported RTE occurred) for this dataset are shown below. Consistent with the previous 13 analyses 'on-set imaging: production process' is the most frequently occurring process code (8.7%, n = 258); examples of this include selecting the incorrect pre-set for an exposure. Guidance on this error can be found in issues 7 and 18 of Safer RT.



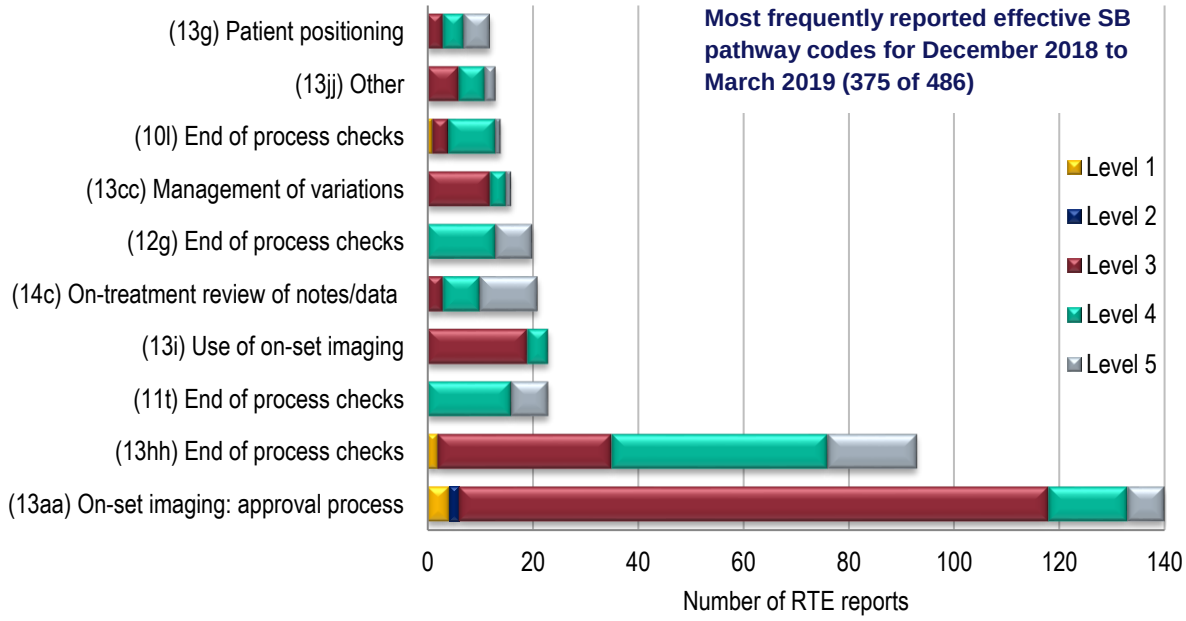
Safety Barriers (SB)

Several individual pathway codes can be allocated to each RTE report to identify all points in the pathway where the error was not picked up. All subcodes were analysed across the 2,960 RTE reports, a total of 1,026 subcodes were identified as failed safety barriers (SB). Only 30 (2.9%) of these RTE were Level 1 or 2 errors where the SB had failed. The most frequent failed SB reported is represented below and are broken down by classification. Treatment unit process 'use of on-set imaging' is the most frequently reported failed SB (13.5%, n=138).



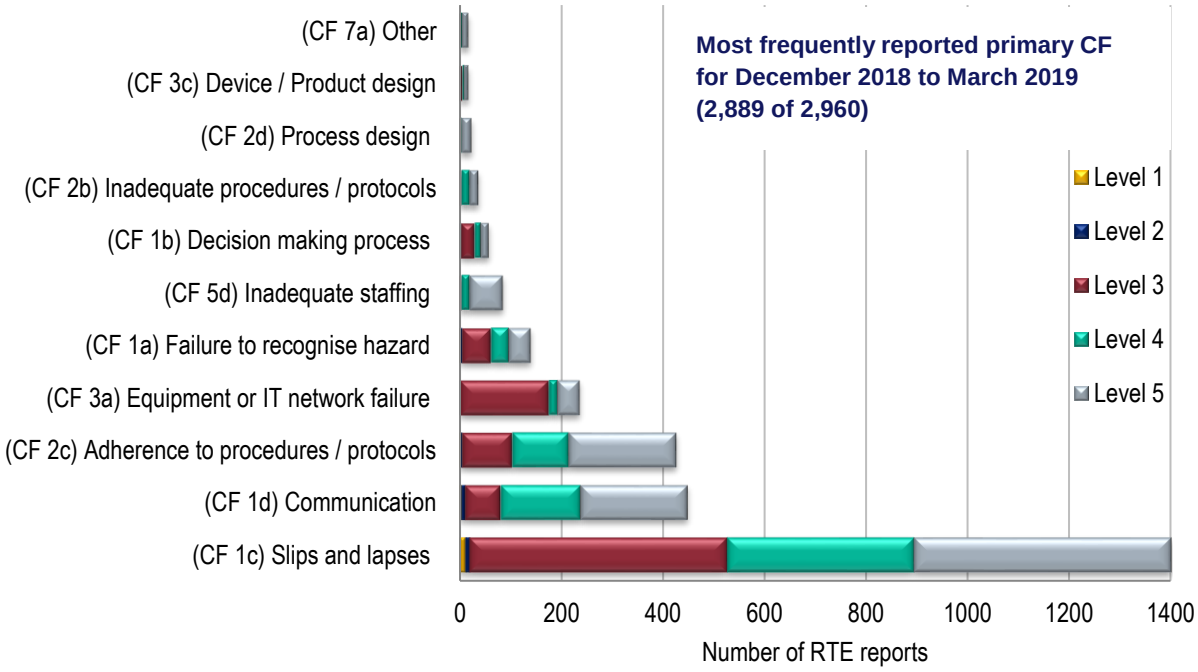
Effective safety barriers or methods of detection (MD) can now be identified utilising the safety barrier taxonomy. For the reporting period December 2018 to March 2019 34 different providers indicated MD across 486 (16.4%) incidents. The most

frequently reported effective safety barrier for this reporting period was ‘on-set imaging: approval process’ (36.5%, n = 140).



Causative Factors (CF)

CF have been applied to 2,717 (91.8%) RTE reports by 45 (83.3%) providers for this reporting period. Following consistency checking, PHE coded a further 243 reports with CF taxonomy, resulting in all RTE reports containing CF taxonomy for the reporting period December 2018 to March 2019. The most frequently reported primary CF are shown below; the most frequent was individual ‘slips and lapses’ (47.3%, n = 1,401). Multiple CF can be associated with each RTE; the primary CF is the root cause and the subsequent CF are the contributory factors associated with an incident. Contributory factors were indicated across 713 reports; 94 of these contained multiple CF leading to 838 contributory factors. The most frequently reported contributory factor was ‘adherence to procedures/protocols’ (41.3%, n = 346).



Case study – Vertebrae image mis-match

Between March 2018 and March 2019 there have been 345 RTE associated with on-set imaging: approval process (13aa). Of these 7.5% (n =26) were associated with the incorrect image match of vertebrae.

An example of this type of event may be as follows –
Palliative spinal treatment (20Gy, 5#), during 1st # On-set verification image completed and matched for spinal treatment. Due to image match digital move of 0.8cm sup completed (within threshold of departmental palliative imaging protocol), patient treated. During offline review it was recognised that the incorrect vertebrae was matched to, leading to a geographical miss. The verification image jaws were the same width and length as the treatment field indicating no distinguishable anatomy. All other #'s treated with wider view on verification image and patient treated correctly.
This might be coded as:
TSRT9/ Level 1/ 13aa/13hh/ MD13aa/CF1c/ CF2c.

Things to consider for reducing vertebrae image associated on-set imaging approval process type of RTE -

- ensure all individuals are appropriately trained and entitled to complete this type of image matching
- review image training and consider frequency of training
- review the type of image taken and the quality of the verification image. Consider the type of image, do you use MV or kV imaging?
- ensure the verification image captures sufficient anatomy for accurate matching
- ensure the reference image is good quality with appropriate anatomy
- reduce requirement for large moves by using appropriate immobilisation equipment, reference marks and couch digital parameter tolerances
- ensure there is an appropriate environment for image matching to take place
- audit couch moves and any authorised overides on this cohort of patients to aid review of couch tolerances

Dates for the diary

10-12 June	UK Imaging & Oncology Congress 2019, Liverpool
27 September	BIR, IRMER update 2019: Optimisation in clinical imaging, London
September	Safer Radiotherapy Issue 29

National patient safety incident reports from NHSI due to change

Due to the development of a new patient safety information management system (the DPSIMS project) the type of data routinely published by NHSI on patient safety incident reports will be changing. This will affect the ability to compare data over time. None of the changes alter the responsibility and accountability of healthcare providers to report and learn from patient safety incidents. Further information is available at:
https://improvement.nhs.uk/resources/national-quarterly-data-patient-safety-incident-reports/#h2-data-workbooks-and-commentary-official-statistics

Risk assessment survey

The IR(ME)R Employer's duties require a quality assurance programme be undertaken in respect of radiotherapeutic practices which includes a study of the risk of accidental or unintended exposures. A survey to identify the current use of risk assessments was sent to all radiotherapy providers across the UK. There were 20 surveys returned, achieving a 32.8% response rate. The survey contained 10 questions, the responses indicated a variation in the use of risk assessments across the UK. The results are outlined in the table below

Question	Response
What type of risk assessment do you currently undertake in your department?	Risk Matrix (n =12) Preliminary hazard and risk analysis (n = 10) Fault tree/event tree analysis (n = 2) Failure mode and effect/ criticality analysis (n = 2) Other (n = 3) (included local NHS system)
Do you have a standard template you can share?	Yes (n = 9) No (n = 8)
What areas of practice do you carry out risk assessments on?	Prior to introduction of new techniques (n =17) Prior to introduction of new technologies (n = 17) On areas of existing practice (n = 14) Prior to introduction of change in process (n = 12) Other (n = 5) (included for ageing equipment)
Who completes the risk assessment?	Radiographers (n = 15) Medical Physics Experts (MPE) (n = 14) Multidisciplinary Team (MDT) (n = 8) Risk management team (n = 4) Radiotherapy Oncologist (n = 2) Other (n = 5) (included approach dependent area)
What training do the individuals who complete the risk assessments have?	Local – Trust level (n = 16) Local – Departmental level (n = 10) Externally provided course (n = 2) Other (n =3) (included MSc modules)
When are risk assessments completed?	Prior to introduction of change/new practice (n = 17) Following the identification of an error/near miss (n = 12) Routinely on existing practice (n = 8) Other (n = 1) (included when something needs replacing)
How are the outcomes of the risk assessments managed?	Escalated to department management team (n = 16) Addressed by local team where possible (n = 16) Escalated to Trust risk management team (n = 14) Communicated to local MDT (n = 10) Other (n = 4) (included depends on the level of risk)
Where are the completed risk assessments stored?	Local risk managing software (n = 12) Local shared drive (n = 9) Local risk register (n = 8) Risk management team (n = 4) Department management team (n = 2) Other (n = 5) (included trust intranet)
How often are risk assessments updated or reviewed?	At time of introduction of change or new practice (n = 10) Annually (n = 8) Every 2 years (n = 4) Every 3 years (n = 1) Other (n = 9) (included in event of new legislation)
Have you already completed a risk assessment on the study of risk of accidental or unintended exposures	No (n = 12) Yes (n = 4) Would rather not say (n = 1)

Guest Editorial

Encouraging Physician Participation in Incident Learning Systems

Suzanne B. Evans, MD, MPH, Associate Professor, Department of Therapeutic Radiology, Yale University School of Medicine. Member, Radiation Oncology Health Advisory Council, ROILS

Incident Learning Systems have been increasingly utilised in the RT community. However, the rate at which different team members participate in incident learning differs[1,2], with participation by physicians as high as 8%, compared to 56% for radiographers. Compounding this is the recognition that physician errors in prescription or outlining are notoriously difficult to detect[3]; so if physicians do not report it, it can potentially go undetected.

As we all think back to errors in judgment, slips, or omissions that are part of our practice as physicians, we will likely find that these cognitive errors have a multitude of causes and predisposing factors[4]. The process of incident reporting or teaching is one thing, but the more important process, as Peter Dunscombe, PhD, would often quip, is to actually achieve incident learning. But to learn, we need to know which factors predispose physicians to error.

Are these factors currently captured in today's incident learning systems? In my mind, the answer is no. A fundamental truth of incident learning systems is that they do not flourish without a developed feedback loop[5]. That is, unless those reporting receive useful feedback on changes made from their reports, they will not report. However, this presently is not the case for physician error. There are doubtless many physician specific factors that influence the quality of the physician work. There is much to be learned about the safest forms of physician practice. We know, for instance, that high volume facilities are associated with better outcomes for head and neck patients receiving RT[6]. But when does high volume become overwhelming? What is the catch rate for error in physician chart rounds, and what are the specific factors that influence this? Are there personality factors which influence physician practice[7]? How does remote access and technological factors (like the seemingly inevitable lag or connection issues in many of our processes) influence our work? What of travel to multiple sites and the inefficiencies therein? With physician error, a first step would be to collect data that might inform safe practice, potentially through questions with branching logic (below table). Until we can both make incident learning systems more influential in physician's day-to-day practice, it is likely that we will see physician error reporting languish.

Physician specific variable	Hypothesis behind this variable
How many patients do you currently have on treatment?	There may be a safety risk to work overload from multiple patients
How many different disease sites do you currently have on treatment?	There may be cognitive overload factor to having multiple disease sites
Is this patient's disease site usual for you to treat?	Unfamiliarity with a disease site may increase likelihood for error
Did you experience technical issues with planning review or outlining?	IT factors may disturb natural systemised process of review and invite error.

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2. Cunningham J, Coffey M, Knöös T, Holmberg O. Radiation Oncology Safety Information System (ROSIS) - Profiles of participants and the first 1074 incident reports. *Radiotherapy and Oncology.* 2010;97(3):601-607.
3. Ezzell G, Chera B, Dicker A, et al. Common error pathways seen in the RO-ILS data that demonstrate opportunities for improving treatment safety. *Pract Radiat Oncol.* 2018;8(2):123-132.
4. Commission TJ. Cognitive Biases in Health Care. *Quick Safety.* (28). Accessed May 26, 2017.
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7. Blakaj A, Kelly JR, Decker RH, et al. Hazardous Attitudes: Physician Decision Making in Radiation Oncology. *International Journal of Radiation Oncology • Biology • Physics.* 2018;102(3):S120.